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December 10, 1951

Dr. Walter D. Claus

L. Joe Deal

INFORMATION FOR GABRIEL

Over the weekend I made some elementary calculations as to the effects of an underground weapon on our European friends. Since time is short, I have not had time to recheck any of these calculations, but I'm passing them on to you for whatever they may be worth.

We know the following: (1) Jangle "Sugar" produced a "hot-spot" of roughly 50 square miles, with radiation levels ranging from 7 r to 14 r. (2) This was a low yield weapon. (3) Trinity produced a similar "hot-spot". (4) Dosages in the Trinity "hot-spot" were sufficient to produce burns on cattle. (5) LA-626 gives measured dosages of 6.5 r at 3.3 hours after shot, 17 miles from zero, and estimated dosages to the cows of 138 r.

For purposes of scaling, let's assume that the size of the "hot-spot" following the detonation of a 20 KT weapon at the surface will go as the cube root of the KT. Thus for a 20 KT weapon we have an area of 2.7 x 50 = 135 square miles. Let's assume that the radiation level will increase directly with the KT, giving us dosages ranging from 140 r to 280 r.

To carry the argument one step further, if one looks at the population density of some of the western European countries, one can easily see that a relatively small number of weapons could subject a relatively large number of people to radiation dosages exceeding those recommended for EW, namely 30 r/day. As an example, if one takes Great Britain, whose population density is roughly 500 people per square mile, and one assumes 5 bombs are exploded on the surface, some 3.4×10^5 persons would be subjected to radiation dosages considered significant from the standpoint of EW.

Att. 1
(Table of European populations)

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cy 4 of 6A - destroyed 4/22/52 - EaB

ORGANIZATION & MANAGEMENT

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BY: DICK KOOGLE 6-12-9

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DOE ARCHIVES

TABLE I

Nation	Square Miles	Population	Approx. Population/mi^2
Great Britain	88,745	44,795,357	500
France	212,736	40,502,513	200
Belgium	11,775	8,344,534	800
Luxemburg	999	290,992	300
Germany	142,200	65,910,999	500
Denmark	16,556	4,045,232	300
Netherlands	12,883	9,124,871	700
Italy	116,000	45,600,000	400
Switzerland	15,944	4,265,703	300
Norway	124,560	3,123,338	25
Sweden	173,394	6,371,432	30

LJD:mc